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ABP

Protecting the Investment

By Wendy Lea McKibbin
Senior Editor

Microcomputers may be the fastest growing segment of the computer market, but minis and mainframes still command the largest market share and support a multimillion dollar industry for computer environmental control equipment.

Not every mainframe needs cloistering in a computer room where heat, humidity, power, dust and air contaminants are tightly controlled. Some mainframes can chug away in a dirty factory environment. A good number of minicomputers can and do operate at normal room temperature, and most business microcomputers perch on desktops scattered throughout the office.

But a mainframe designed for use in a special computer room is like a snail out of its shell if the air conditioning is snafued.

Management Information Systems (MIS) manager Joe Riera recalls an experience that illustrates the environmental care demanded by "prima donna" mainframes. Now the Director of Information Systems for Plantronics Corp., Riera once worked for a company in San Diego during a particularly hot summer. One week the air conditioning for the entire building went out, bringing activities in the computer room to an abrupt halt. Unfortunately, the necessary part needed to reinstate the system could only be obtained in Virginia. Thus it was not expected that the cooling system would be operational for several days.

Riera solved the problem in an unusual fashion. He went to United Airlines and borrowed a portable air conditioning unit used for cooling the DC8 jets. The system sits on a flatbed truck and has an enormous tube hooked to its side. Riera rolled the unit to the back door of the computer room and fed cool air during the evening hours—the only time he felt it was safe to run the mainframes.

Big systems like the ones Riera tended are not the only pampered machines in today's corporation. Several major precision air conditioning companies report that at least half of their environmental control systems are sold to minicomputer users. Marketing manager Tom Brown of Liebert Corp. in Columbus, OH, explains that the principles of heat and humidity control apply to any sized computer, although obviously a smaller, more sparsely packed system wreaks less havoc on its surroundings than a large one.

"It's like putting one coffee pot in the kitchen, versus 1,000 pots. In both cases you have the same electrical equipment, but with quite different effects on the environment," says Brown.

Generally speaking, minicomputers are better able to survive in an office environment because they are designed with fewer components, hence generate

At left: The DPU 360, from Innovations In Control Inc., is a self-contained alarm/control system whose sensors monitor all aspects of operating conditions in a computer room. The unit alerts personnel, and if necessary powers down the computer. Temperature, humidity, line voltage, line frequency, smoke, water, blackout and brownout are monitored. The front panel displays temperature and humidity and pinpoints the reason for an alarm via latching indicators. This eliminates the confusion of multiple alarms and provides information at a glance. In case of an alarm an optional dialer dials a preprogrammed phone number and transmits a recorded message.

Above: These "stack pack" modules from Data Systems Design minimize the effects of heat and humidity on microcomputers by breaking up the system into several units. The bottom module houses the central processing unit; other modules contain the Winchester disk drive, the tape drive and floppy disks. Data Systems Design claims that by separating the components of the system into small boxes, there is less heat and less noise than one would find with single boxes. The company also claims that the air temperature inside each box only rises three degrees by the time it leaves the module.

less heat. But Brown is not certain that minis and humans can always happily coexist without special environmental intervention. A mid-sized system emits 650 British thermal units (Btu) per hour, just as does the human body, which means that a computer plus a human equals two people in terms of the air conditioning load. There is also the problem of noise.

"In order to be competitive, NCR, Burroughs, Digital and other companies have said that a minicomputer can go into the office environment. But add disk drives, printers, more memory, and suddenly, you have a heat load and noise problem," says Brown. "At that point someone is likely to put the system in a back room, where it will not be heard." He concludes that then the small enclosure will heat up, thus requiring environmental control.

It is Brown's conviction that if the average field engineer were questioned long enough, he would admit that systems with heat, humidity and power supply control see a longer period of time between service calls. Jim Good, vice president of marketing for AC Manufacturing Co. (makers of the "EdPack" environmental control system) agrees with Brown.

"Thermal shock stresses any computer equipment," says Good, in explaining the need for a constant temperature. "It's like bending a coat hanger again and again in the same place, which makes it susceptible to breaking."

Does that mean every mini needs more precise control than the normal office environment in order to function at its optimum level? Not quite, says a spokesman for Digital Equipment Corp.'s (DEC) corporate environment field support group.

Liebert Corp.'s top-of-the-line microprocessor control system, Deluxe System/3, monitors both locally and remotely, and is programmable. This System/3 microprocessor monitor panel indicates operating mode, room conditions and alarms, and programming of the system. Liebert claims to be the only company offering both environmental control and power protection systems that interface with a single remote, standalone monitoring system.

"It really depends on the customer's applications as to whether or not heat and humidity have to be tightly controlled," says the DEC spokesman. "If the customer can live with a 95 percent availability of his system, he can probably stand housing his minicomputer in a nominal environment. If he needs 100 percent availability of the system, then tight control is advisable."

Murray T. Smith, treasurer of Antioch Publishing Co. in Yellow Springs, OH, is a former DEC customer who decided that a minicomputer needs "the second mile" of protection. He recalls that two years ago, after a rather dismal experience with a PDP-11/34 that "could barely stay up for 12 hours at a stretch," he decided to take drastic measures. He not only switched to an equivalent Hewlett-Packard system, but he purchased an environmental control unit from Liebert that incorporates heat, humidity and power management into a single system.

"I have a very expensive mini that represents a $400,000 investment," says Smith. "I felt that it was more than worth it to invest $1,000 in environmental control."

Even more than the regulation of heat and humidity, Smith found that the power supply control provided by the Liebert unit was invaluable to the proper functioning of his system, given the erratic power supply in his area. He explains that Yellow Springs is a village of 5,000 that buys its electricity from

Dayton, with sometimes unpredictable results.

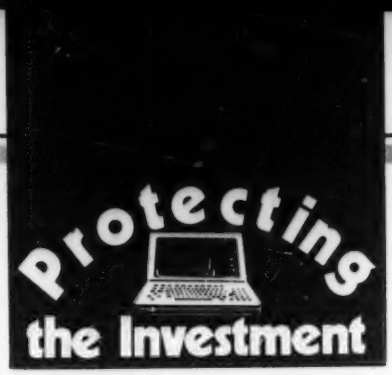
"Our irregular power supply may have had as much to do with the poor performance of the DEC system as anything," Smith speculates. "All I know is that now my minicomputer works fine, and I would recommend anyone taking similar steps to protect his investment."

Apparently, Smith's experience is not that unusual, according to Jim Garrett, product marketing manager for Air Flow, one of the larger precision air conditioning companies that cater to the computer industry.

"Several years ago a number of computer equipment manufacturers came out with medium- to large-sized systems that supposedly did not require environmental control," says Garrett. "But after experiencing a great deal of downtime and maintenance costs, users went back to using dedicated computer rooms with air, humidity and power regulation."

Garrett thinks that the industry will be using systems such as the ones made by his company for some time to come, given the current state of technology. "If the central processing unit (CPU) of a system could be hermetically sealed, and the core cooled with helium, nitrogen or water, then possibly we would see an end to environmental control," he says. "But the humidity issue would still exist for printers and certain peripherals."

It would appear that heat and humidity are always a problem in a data



High temperatures aggravate a situation and tend to flush out the weak spots in a component.

center, where optimum conditions for operation are 50 percent relative humidity and 70 degrees Fahrenheit. If the humidity increases above 60 percent, the likelihood of a layer of water molecules developing on the equipment increases, thus posing long-term problems of corrosion. If the humidity decreases below 40 percent, then static electricity builds up.

Static is a problem for computers and peripherals alike. It particularly bothers computer media such as paper, cassette tapes and other magnetic storage devices. Too much static electricity can cause paper to stick in a printer and can even cause disk drives to misread. (Thus in DEC's plant in Greenland, where the humidity is five percent, the magnetic storage devices are stored in a secluded location to minimize discharges from human contact.)

If static electricity touches the integrated circuit board itself, it can damage the molecular structure of the circuitry and weaken the components. While this is not as much of a probability after the computer has been assembled, the danger posed by static electricity has caused component manufacturers to take more protective measures in recent years.

According to a Hewlett-Packard spokesman, integrated circuit manufacturers have been so diligent in providing anti-static protective measures in the factory and in the field, that components have seen a dramatic quality increase since 1975. The failure rate for components tested today at the Hewlett-Packard facility is one-half the number it was eight years ago, the spokesman explained, which indicates a fundamental change in manufacturing procedures.

While more often than not it is static electricity stemming from low humidity that troubles the data center—because computers put out a dry, hot heat that dehydrates the ambient air—high humidity can also occur, and with it comes problems. For example, damp air can lead to corrosion, can cause paper to

They Survived the Tent at NCC

The "tent" at the 1983 National Computer Conference (NCC) in Anaheim, CA, last May was the scene of a *brouhaha*, when the air conditioning failed to function properly and temperatures and tempers soared. Angry exhibitors housed in the pavilion rather than in the main building sweltered in the 114°F heat as they struggled to keep systems from crashing. But a surprising number of microcomputers passed the "NCC Heat Test" with flying colors, thus illustrating the hardiness of low-end systems, and the relative freedom they enjoy from environmentally controlled conditions.

"The boom in the personal computer market will not affect the overall growth of controlled environment equipment," says Jim Good, vice president of marketing for AC Manufacturing Co., a firm which makes precision air-conditioning equipment. "I wish it were otherwise, but I don't think microcomputers would sell unless they could be used just about anywhere."

It seems safe to say that the NCC tent where the temperature was 114°F is an extreme case of "just about anywhere."

"I was frankly amazed that our system worked as well as it did," says Al Davis of Molecular Computers, who ran his "SuperMicro 32" computer with 12 terminals during the entire show. The only problem Davis encountered was that two to three times a day, the system would "hang" or suspend operations. This required the power to be turned off, before the system could be brought up again. Later, everyone who worked at the Molecular booth received a T-shirt with the slogan, "I survived the tent at NCC."

Another happy survivor was Dave Callan, chairman of Callan Data Systems, whose company had six systems set up in the tent. "We burn in our systems at 104°F," says the incredulous Callan, "which means that our systems prevailed in the tent under higher temperatures than we use for testing purposes!"

Callan reports that his systems never did go down, although on the hottest day he noticed that one was exhibiting "erratic behavior." The peripherals and floppy disks suffered far more than the systems did, he recalls.

"Actually, microcomputers are pretty tough where heat is involved," says Callan, who remembers a bizarre incident that happened several years ago in his plant. One day an electrical storm caused the power in the company's building to switch off and on, thus making an oven malfunction in one of the testing chambers. There was a microcomputer accidentally left in the oven that endured a temperature of 200°F—just short of boiling.

"All of the plastic melted," recalls Callan. "The system keyboards sagged, the front cover of the unit was distorted, the floppy disks literally dissolved." But the system was made of hardier stuff. When an engineer discovered the unit and turned it on, it worked.

absorb moisture, and can damage the integrity of the integrated circuit packet interconnections. Humidity can also activate contaminants in the air such as chlorides. These contaminants, to which computers are more sensitive than humans, can cause corrosion, migration of copper and other metals, and can cause interference with the circuits.

But the standard imp of the computer room is heat. High temperatures aggravate a situation, and tend to flush out the weak spots in a component, says Jim Gillette, quality and reliability manager for the Data Systems Div. of Hewlett-Packard. The higher the heat, the more accelerated the failure rate for a given device. If, in the original design of a component, the designer has allowed a margin for heat, the part can withstand natural thermodynamic changes without experiencing damage, he explains. But if there is some imperfection in the part, excessive heat can cause a hard failure of the circuitry, leading to electromigration, even irreversible damage.

An example of an imperfection, says Gillette, might be an integrated circuit that has a faulty seal around the pins. When the power is turned on, the moisture is driven out. But when the piece cools down, the moisture is drawn back in where it can react with corrosive elements.

This one example of what heat can do to a solid state device readily explains the continuing presence of dedicated computer rooms, despite the fact that some of the newer systems have cooling capabilities built into the equipment.

Actually, a system can be designed to function under almost any condition, as witnessed by the fact that integrated circuits can operate under the hood of a car, says a Burroughs spokesman. But there are trade-offs in speed and function. The intended environment specifies the permissible density of circuit board packaging, the power requirement and the manner in which heat will be removed. Any way you cut it, says the Burroughs spokesman, a system designed for a controlled environment will offer more performance per cubic foot than a system that can function at random locations in the factory or office. Which is one reason why there may be dedicated computer rooms long into the foreseeable future.

Distributed data processing in general and the influx of microcomputers in particular *are* making changes in the controlled environment picture. But some think they may never totally eliminate the need for dedicated computer rooms.

According to sources at both Burroughs and DEC, there will always be a need for mainframes. And as long as there are mainframes, there will always be a need for a central computer room characterized by environmental control and maximum security. They say there are two reasons for this. First, a mainframe offers more performance per dollar investment when heat, humidity and power can be tightly managed. And secondly, mainframes often handle data of a confidential nature. Thus the need for performance and security virtually ensures the status quo of the computer room.

As a matter of fact, business is up for several of the major precision air conditioning companies who supply equipment for these rooms, such as Air Flow, who claims to have seen a 500 percent increase in its domestic sales last year. HiRoss reports a 200 percent increase, and Liebert says that sales are "strong." Furthermore, according to a recent Frost & Sullivan report, the annual growth rate of the market for computer environmental support equipment is nearly 18 percent, which, the report says, "is somewhat better than that of the computer equipment itself."

One reason for the strong sales, says HiRoss, is that many people are upgrading their equipment. More power means more heat, which means the need for better heat and humidity control. Another reason for the increased business, says Liebert, is that people are beginning to recognize the value of protecting their investments. Still another reason, says Frost and Sullivan, is simply that high-end computers are continuing to penetrate new markets, although at a slower rate than micros. And the big systems require special environmental attention.

But at least one MIS manager does not view this news as progress. "I think we will never realize the full potential of distributed data processing and the information explosion unless we can shake free of the old-styled, air-conditioned computer room," says Bob Graham, MIS manager for the DEC plants in Europe, "and put systems out on the floor, as needed."

If Graham is right, then full fruition of the distributed data processing movement may be a long time in coming. For environmental control systems seem to be here to stay. (IN)

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Protecting the Investment

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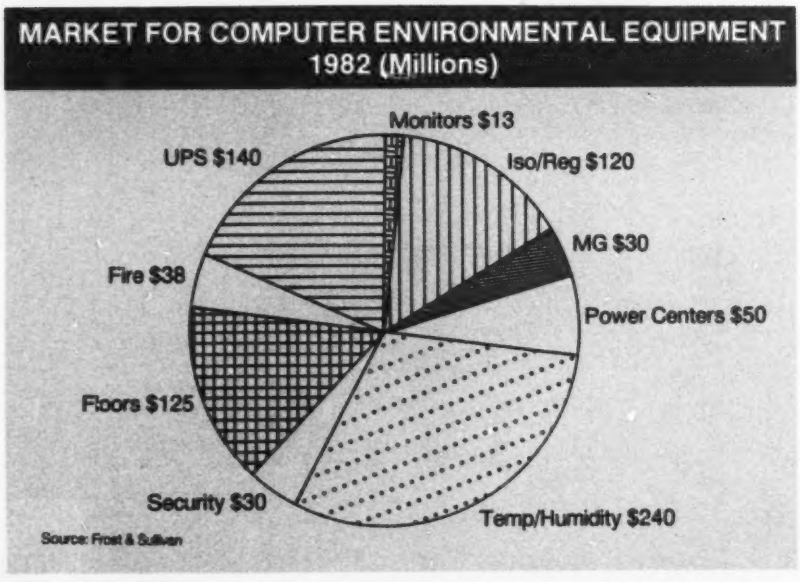

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Semi-Annual Software Review

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Office Automation

Many managers see OA simply a means to speed up clerical tasks

Can office automation live up to its highly touted role as savior of white collar productivity? One expert says yes, if managers overcome misconceptions about what the technology can do for them and their staffs.

Commenting on an office automation survey sponsored by Honeywell, author and Yale professor Dr. Rosabeth Moss Kanter said that many managers perceive office automation as simply a means to speed up clerical tasks like typing, overlooking its potential to help analyze information and solve problems. In addition, managers do not appear willing to delegate more responsibilities to clerical staff whose time has been freed up by office automation tools.

"Computers are being used (in offices) mainly as 'hand tools' to relieve drudgery instead of as 'head tools,' " stated Kanter. "Managers want to maintain current roles and, in some cases, even use automation to eliminate rather than increase communication with workers."

The Honeywell survey, conducted by Response Analysis, Princeton, NJ, indicates that office automation is still the exception rather than the rule in most companies. Less than half of 443 companies surveyed has word processors, while three out of four secretaries and nine out of ten managers do not use personal computers.

Smaller companies and those located in the South were found to be particularly lagging in implementing office automation. The study also shows the great majority of managers and office workers believes that office automation is positive. But senior managers and secretaries were more likely than others to have doubts about its benefits in their own jobs — as were managers that don't type. This suggests people associate office automation with clerical tasks.

Kanter said that office automation can boost productivity only if managers, office workers and vendors work together to implement systems to do more than typing. "We need to create conditions, especially inside large organizations, that make it possible for individuals to get the power to think, to experiment, to create, to develop, to test, to innovate," she said. "Whereas short-term productivity can be affected by purely mechanical systems, innovation requires intellectual effort."

When planning for office automation, companies should form a steering committee that emphasizes obtaining feedback from all levels of the organization, Kanter advised. This feedback should continue through implementation of the system, training, and then monthly on a permanent basis after the system is in use. —DHF

Personnel

Computer professionals pleased with jobs

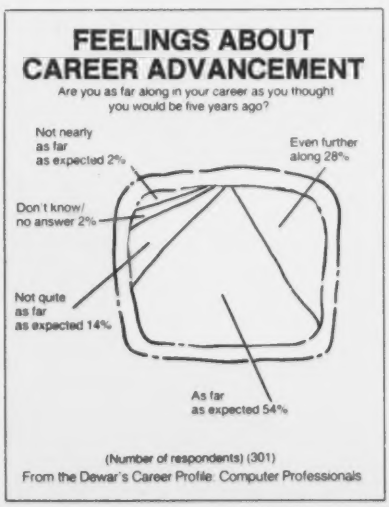
A national career survey on the computer industry reports high levels of satisfaction among computer professionals and cites creativity as the single most important aspect of the job.

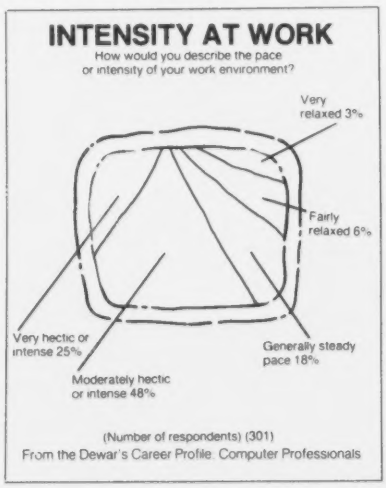
These are some of the major findings in the newly released *Career Profiles of Computer Professionals* based on interviews with over 300 men and women currently employed in the computer field.

The high degree of job satisfaction is demonstrated by the fact that 94 percent of the computer professionals polled said they would not consider leaving the data processing (DP) field. Eighty-one percent indicated they would not move into another area of DP.

Part of this satisfaction can be attributed to career advancement. More than half of the respondents said they are as far along in their careers today as they thought they would be five years ago. Another 28 percent indicated they are further along than they thought they would be.

The survey, conducted by Research & Forecasts, Inc., New York, and sponsored by Dewar's "White Label," identifies three types of computer professionals: computerholics, overtimers and nine-to-fivers.





Computerholics, who devote at least 50 hours a week to their jobs, comprise 22 percent of all computer professionals and function in an environment they describe as "extremely hectic." Overtimers, who spend between 41 and 50 hours a week at their jobs, constitute 57 percent and describe their work as "moderately hectic." Nine-to-fivers, who devote 40 hours or less a week to their jobs, describe their work as "generally steady or relaxed."

Despite the theory that the computer revolution would usher in a paperless society, computer professionals overall cited paper work as the chief complaint.

Survey findings also show that computer professionals acknowledge the technical requirements of the field but feel that "being creative" and traditional English skills are very important to the successful pursuit of their careers. —WJC

operations management; MAI Sorbus Service Div., accountable for maintenance; Software Centre International, supplier of software; Moore Business Center, supplier of computer-related products; and PC Telemart, an on-line and hardcopy library service and supplier of products.

"We've set it up so the federal employee has genuine 'one-stop shopping,'" explains Bill Frazer, special assistant to the administrator. "We offer lower-than-retail prices and a wide array of support functions, which include training, configuration and pre-purchasing assistance, maintenance and hand holding after the purchase."

Because of the emphasis on pre- and post-sale support, sales are limited to a 50-mile radius of the store. Frazer stresses that it would be too difficult to properly service users outside of the immediate area, but that eventually other government employees might enjoy similar provisions.

"This is a pilot project. If it is successful we have plans to expand to the rest of the country with other stores," says Frazer, who identifies some possible sites as San Francisco, Denver, Chicago, Kansas City, Atlanta and New York City.

So far, the GSA store has exceeded the administration's highest expectations. It was estimated that the operation would be a $2 to $3 million business in its first year. Since its debut in August, it has already grossed $4 million. The staff of sales and support professionals has increased from 10 to 24 people.

The single largest user

The potential volume for stores such as this prototype is colossal. Long recognized as the single largest user of computer services, the federal government is expected to have as many as one million microcomputer users in its employ within the next six years. The magnitude of computing power needed by the administration can best be understood when one recalls that the government is nothing but an information business, Frazer points out.

To meet the growing needs of federal users for personal computing power, the GSA store is well-stocked with an extensive menu of hardware. The choices for a qualified employee include the IBM PC or XT; the Apple IIe, III or Lisa; the DEC Rainbow or Professional system; the Osborne OCC-1 and Executive I; or systems made by Compaq, Fortune, Zilog, Molecular, Altos, Onyx or Televideo.

Frazer quickly declares that no federal hireling is expected to brave this hardware extravaganza alone. The primary purpose of the store is to shepherd the individual through the PC wilderness until he or she finds the perfect system for the problem at hand.

Setting up the federal computer store was more complicated for the GSA than it would be for a member of the private sector, says Frazer, due to the many rules and regulations which have to be observed. "But if I were an MIS director

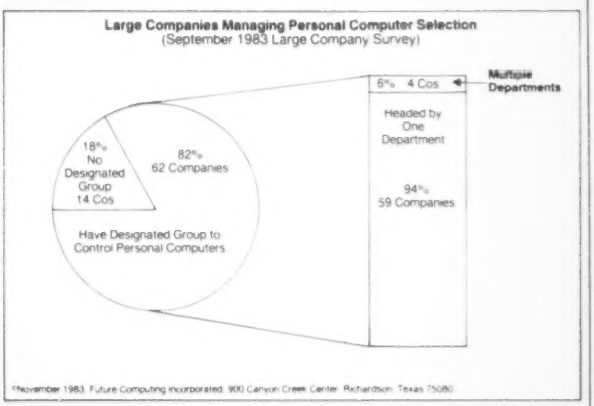
PCs Now Firmly Under the Wing of MIS?

Much evidence suggests that the majority of Management Information Systems (MIS) managers now realize the acquisition and support of personal computers is an extension of their regular roles. At least that's what a recent survey conducted by the Texas-based research firm Future Computing seems to indicate.

The company did a random sampling of the 2,000 largest US corporations to determine how widely personal computers were being used and how much support the microcomputers were receiving within the organization. They found, among other things, that 77 percent of the MIS directors interviewed had a lead or key role in establishing PC policies.

The in-house support figures broke out as follows:

- 76 percent of the companies had some central facility for PC support;
- 58 percent offered training and user support only;
- 6 percent had an in-house computer store in place (similar to a commercial retail outlet) staffed by the MIS/data processing (DP) organization. The typical in-house store provided product demonstrations, group and individual training sessions, coordination and purchases and service needs.



Management of Personal Computers in Large Companies

	# of Companies	% of Companies
Have Not Designated a Group or Department for PC Management	14	18
Have Designated a Group or Department	62	82
PC Management Led by	# of Companies	% of Companies
One Department	58	94
• Which is:		
DP	25	43
MIS	19	33
Corporate	10	18
Communication	2	3
Other	2	3
Multiple Departments	4	6
• Which		
Include MIS or DP	4	100
Do Not Include MIS or DP	0	0

*November 1983, Future Computing Incorporated, 900 Canyon Creek Center, Richardson, Texas 75080

According to Dr. Harold Kinne, senior vice president of Future Computing, widespread recognition exists among companies surveyed that MIS was an ideal center for coordinating PC activities and support. Eighty-two percent of those questioned by Dr. Kinne had designated a particular group in the organization to manage personal computers. Of that number, 94 percent had a single department responsible for coordinating PC activities. And 76 percent of the time, that single department was data processing or MIS.

Almost all of the companies in the survey intend to increase user support for personal computers within the next few years, although not necessarily in the form of an in-house computer store. This is advisable, says Kinne, in view of Future Computing's estimates that there may be as many as 1,975,000 personal computers shipped to US businesses by 1988. (IN)

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The 'Mythical' Datacomm Manager

By Wayne L. Rhodes, Jr., Editor
and Perry S. True, Director,
Hitchcock Research Services

An unprecedented survey of Management Information Systems/Data Processing (MIS/DP) managers reveals that the emergence of data communications is expanding not diminishing their own role. Three quarters of the nearly 1,600 survey respondents said datacomm responsibility rests with MIS/DP. Fewer than 12 percent of the respondents said the person responsible for datacomm is the Data Communications Manager. Of those few who replied that they even have a datacomm manager, 67.5 percent said that person reports to MIS/DP.

The survey, conducted by Hitchcock Research Services of Wheaton, IL, indicates the extent of present datacomm usage and expansion plans for various systems and products. The respondents also offered candid views on major problems they're encountering and on the factors they consider most important when purchasing datacomm systems and equipment.

The survey was conducted in January 1984, with questionnaires mailed to 4,000 persons drawn from a nationwide sampling across all industries. Among the respondents, 81.7 percent have MIS/DP job titles (77.8 percent man-

Many suppliers are looking for a datacomm manager to buy their wares, but a recent survey indicates that person is little more than an extension of the MIS/DP manager's role and doesn't actually exist.

Role in the Specification or Purchase of Data Communications Equipment and Services

Advice and consult	73.6%
Determine the need	73.5%
Recommend type of equipment or supplier	63.8%
Specify type of equipment or supplier	51.4%
Approve the purchase	38.4%
Not involved	3.8%
Base	1,538 100%

Expansion Plans by Present Users (Next 12 Months)

	Local Systems	Metropolitan Area Systems	Long Distance Systems
Base: Presently Have System	1,176 100%	496 100%	859 100%
Will expand moderately	47.4%	40.3%	40.5%
Will expand substantially	10.3%	9.5%	12.5%
Will change or replace present systems	12.2%	9.7%	11.8%
No changes planned	30.1%	40.5%	35.2%

agement; 3.9 percent staff) and 18.3 percent are from corporate management. Responses came from 1,575 persons providing a return of nearly 40 percent to the four-page questionnaire.

Those using or planning to use datacomm were asked to say how they are personally involved in the specification or purchase of equipment and services. Seventy-four percent said they determine the need; 63.8 percent recommend the type of equipment and supplier. Fifty-one percent specify the equipment or supplier. Nearly 40 percent approve the purchase.

Management not attuned

Except for the MIS/DP role, the status of data communications within organizations appears to be not particularly well defined. Nearly 18 percent of the respondents said datacomm falls under some other function within their organizations. Those functions encompass a wide gamut that probably indicates the state of datacomm implementation itself. For example, datacomm responsibility resides as high as the Chief Executive Office or with a "committee headed by the President." Or it also sits with such disparate entities as the Administrative Services Director, the Business Manager, the Chief Engineer or the Controller/Comptroller.

Still others don't report the datacomm responsibility sitting nearly so impressively. Some named the Technical Support Analyst and Systems Programmer as having responsibility. Some indicated it has little or no status: The "General Manager will have the responsibility at the outset" in one organization; the manager of long-range planning has it in another. One respondent said, "No one is really in charge. Upper management is not attuned." Another lamented that nobody has really taken on the responsibility.

The level of implementation seems to be as varied as the designation of responsibility. Survey respondents were asked to indicate which of three datacomm system types their company presently has or plans to add in the next 12 months. The three systems are local, metropolitan and long distance. Nearly 75 percent responded that they have a local system; 31.5 percent have a metropolitan; and 54.5 percent have a long distance one.

Anticipate change

By company size, usage of datacomm was slightly higher as the number of employees in the company increased. By industry, the financial, transportation and DP service organizations reported the highest usage of one or more of the three systems studied. Those in construction/mining/agriculture reported the lowest level of usage.

Those using datacomm were asked to indicate what their plans are for the next 12 months. Of the 1,440 who indicated that they presently use datacomm, all answered one or more parts of the question. Of those who said they have local systems, 47.4 percent said they will expand moderately; 10.3 percent plan substantial expansion; and 12.2 percent will change or replace their present system. Thirty percent plan no changes.

Deregulation of AT&T may be causing concern among users, especially those who responded that they anticipate changes in their current systems. Of those with long distance systems, 40.5 percent plan to expand moderately; 12.5 percent substantially; and 11.8 percent expect to change or replace their current system. Thirty-five percent plan no changes.

What's important

Activity in the metropolitan area systems is similarly vigorous, although those standing pat is higher than with the other two systems. Respondents planning to expand moderately came in at 40.3 percent, but 40.5 percent said no changes are planned. Those expanding substantially and changing or replacing the present system were similar figures, 9.5 and 9.7 percent, respectively.

Those using datacomm were asked to indicate which of 12 products and services their company presently uses and which they plan to add within the next 12 months. Of the 1,440 current users, 98.7 percent answered as to types of products/services they presently use. Of